

I claim:

1. A method of embedding a digital watermark in a host signal comprising:
converting a message into a digital watermark signal having an attribute that
orients the watermark in the host signal, wherein said converting modulates the message
5 using shift key modulation and the attribute is at least one frequency of the shift key
modulated signal; and
applying the watermark signal to the host signal.
2. The method of claim 1 wherein a message is encoded by converting symbols
10 of the message into signals at selected FSK signaling frequencies.
3. The method of claim 1 wherein said converting includes modulating with a
carrier that varies with the host signal.
- 15 4. The method of claim 1 wherein the digital watermark signal varies based on an
extent to which selected host signal samples have a property consistent with the digital
watermark to be embedded at the selected host signal samples.
- 20 5. A method of embedding a digital watermark in audio comprising:
converting a message into a digital watermark signal having an attribute that
orients the watermark in the audio, the converting encoding the message in a carrier,
including using shift key modulation to form a modulated signal, and the attribute is
spectral attribute of the modulated signal; and
embedding the modulated signal in the audio by modifying the host according to
25 the modulated signal.
6. The method of claim 5 wherein the modulated signal comprises a one
dimensional signal that varies over a time dimension.

7. The method of claim 5 wherein the modulated signal is redundantly encoded in different parts of the audio.

8. The method of claim 5 wherein the watermark has two or more modulated
5 signal components, each carrying a different message.

9. The method of claim 5 wherein the message is comprised of two or more symbols, and the symbols are converted to signals at a selected signaling frequency.

10 10. A method of embedding a digital watermark in a host signal comprising:
converting a message into a digital watermark signal having an attribute that
orients the watermark in the host signal, wherein said converting modulates the message
with shift key modulation and the attribute is a spectral property of the modulated signal;
and
15 applying the watermark signal to the host signal.

11. The method of claim 10 wherein the spectral property facilitates detection of the scale of the watermark in the host signal.

20 12. The method of claim 10 wherein the modulated signal has two or more components, each with a phase offset that facilitates detection of the position of the watermark in the host signal.

25 13. The method of claim 10 wherein the modulated signal has two or more components, each with a selected signaling frequency, the components being arranged in the host signal so that the signaling frequencies facilitate detection of the position of the watermark in the host signal.

30 14. A computer readable medium on which is stored instructions for executing the method of claim 1.

15. A method of decoding a digital watermark in a host signal, wherein the watermark comprises a modulated signal, and wherein the watermark includes a message that is encoded by modulating symbols onto a carrier signal, said method comprising:
- 5 using a relationship of spectral attributes of the watermark to determine orientation of the watermark in a host signal, the spectral attributes being used to determine orientation and to carry a message; and
 decoding the watermark.
- 10 16. The method of claim 15 including:
 reading a message encoded in the watermark.
17. The method of claim 15 wherein the attribute is a signaling frequency.
- 15 18. The method of claim 17 wherein the signaling frequency facilitates detection of scale of the watermark in the host signal.
19. The method of claim 15 wherein the host signal is an audio signal.
- 20 20. The method of claim 15 wherein modulating symbols on the carrier comprises shift key modulation.